AMATEUR SATELLITE REPORT

AMSAT's Newsletter for the Amateur Space Program.

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Editor: Vern Riportella, WA2LQQ
Contr. Editor: George Johnson, W0MD
Harold Winard, KB2M
Managing Editor: Bob Myers, W1XT

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(See last page for details)

Antenna Accident Claims OX3FS; Had Spotted UO-11 In May

Finn Steenstrup, OX3FS, of Sondre Stromfjord died 21 Oct. 84 of injuries sustained in a fall from the supporting pedastal of a large dish antenna. He had been instrumental in the successful recovery of UO-11 earlier this year when the 2 meter beacon fell silent after only 3 orbits.

According to Dr. Robert Leonard, KD6DG, Finn fell from a height of about 30 feet to a concrete slab when, apparently, a harness failure occurred. He had been scaling the side of the conical pedastal as part of a routine maintenance activity when the mishap occurred. Dr. Leonard is Director of the Radio Physics Laboratory of SRI International, Menlo Park, CA. SRI International runs the facility at Sondre Stromfjord as one of series of experimental facilities around the world.

UO-11 was launched into a perfect orbit 1 Mar. 84 but fell silent on only its third orbit. (*ASR* #73, 74.) It was thought a cold regulator or oscillator was causing a current-starved oscillator to generate sufficient noise to block reception of ground-originated commands. UO-11 remained silent while scientists and engineers at the University of Surrey rebuilt the command station in an effort to shower UO-11 with more RF to overcome the presumed white noise of the reluctant oscillator.

Making matters somewhat more complex was a lingering uncertainty regarding the spacecraft's precise location. Skin track radar seemed to confirm the NASA 'two-line' Keplerian element sets, but, recalling an earlier mixup in the booster and the spacecraft (AO-8), additional location confirmation was desireable. After several weeks of unsuccessful command efforts from Surrey and with concern for the spacecraft growing, Martin Sweeting, G3YJO, and his team at Surrey developed a scheme to help confirm the orbital predictions. He calculated that given the known local oscillator power and other factors of UO-11's 1.2 GHz command receiver, a sufficiently sensitive L-Band receiver could likely detect the feeble emissions of UO-11's L-Band command receiver.

Acting upon these calculations, AMSAT's WA2LQQ contacted Dr. Leonard at SRI International in Menlo Park. Recalling the effort Dr. Leonard and his team had expended with commanding the UO-9 beacons off (ASR 42, 22 Sep. 82), WA2LQQ inquired whether the same 150 foot dish at Menlo Park might be turned to the task of locating UO-11. Immediately Dr. Leonard countered with a suggestion that an L-Band receiver was already in operation under the auspices of SRI in Greenland and that it probably was fitter than the 150 foot dish in California (cover of *ORBIT* #12, Jan/Feb 83) for the task at hand.

Within days Dr. Leonard had contacted Finn Steenstrup in Greenland. Steenstrup, a ham for years was up to the challenge and wasted no time. Based on a communication link established from Surrey to Menlo Park via Telemail and thence to Greenland by telephone, the frequencies and ephemeris information was passed on where and when to listen. Then on 11 May the weak (+7dBm at the source) signal was heard on two successive orbits. This confirmed two essential facts: UO-11 lived and was where it was expected.

Elated by this good news the team at Surrey, just completing their command station upgrade, successfully commanded the 2 meter beacon on on 15 May thus ending a potential nightmare for the hardworking Surrey team. Launching UO-11 itself had been a minor miracle given the extraordinarily tight schedule afforded. Now, with the successful recovery aided by SRI International and OX3FS, the UO-11 telemetry could begin to be exploited.(*ASR* #77)

It was while working on the selfsame 100 foot radar dish at Sondre Stromfjord Greenland that OX3FS fell to his death. He had been the Station Chief there and had been, according to reports, delighted to help his fellow hams in the UO-11 effort. Finn Steenstrup was a professional engineer holding BSEE and MSEE degrees. He worked for SRI International as a Senior Research Engineer for the past 5 years. He worked for the Radio Physics Laboratory of which Dr. Leonard, KD6DG, is head. According to initial reports of the accident he fell about 30 feet when his harness broke. He was taken to a nearby air base where he was treated for broken bones. He expired in hospital about four hours after the accident. The body was flown to Denmark for autopsy, there being no suitable facility at Sondre Stromfjord. The report was unavailable at presstime but Dr. Leonard suspected internal injury such as a ruptured spleen or spinal cord or cranial injury will likely be found the cause of death. Finn is survived by a wife and son at home and a daughter studying at the University of Michigan. He was

44 years old. Amateur Radio is a special fraternity by any reasonable measure. Many around the world who now enjoy using UO-11 owe a small debt to the enthusiasm and professional talents of a fine man they never knew. AMSAT's Executive Vice President WA2LQQ expressed the grief of the Amateur Satellite community on behalf of AMSAT and the University of Surrey Satellite Laboratory to Dr. Leonard and by extension to the Steenstrup family. AMSAT will offer the Steenstrup family a modest memorial token on behalf of grateful satellite users around the world. Dr. Leonard will accept on behalf of the Steenstrup family at the Second Annual Space Symposium, Saturday 10 Nov. 84 in Los Angeles.

Short Bursts

• Chief Area Coordinator Jim McKim, WØCY, has announced the appointment of an additional Area Coordinator for southern Florida. Mike Crisler, N4IFD of Miami is the new Area Coordinator and will have a splendid demo station at the big Miami Hamfest. Mike's address is 8341 S.W. 137th Ave., Miami, FL 33183.

• When mentioning the scoring of the Stoner Challenge Cup recently, we mentioned the scorer but omitted his call. AMSAT is indebted to Walt Rader, WA3DMF, for his great help in scoring the contest!

• Talk about sound alikes...Recently we learned of a satellite being launched for a consortium of Arab nations. Naturally it will be called Arabsat. (No Ethel, NOT Sheiksat!). Now we have learned of another one for Pakistan. Of course it will be called...PAKSAT! Thus there will soon be PACSAT and PAKSAT aloft. All's well 'cause we have it from the statisticians that AMSTAT is behind it all. (AMSTAT is the American Statistical Association!)

• K8OCL will be writing a regular column for the QCWA News promoting AMSAT. Watch for it.

• Defend Amateur Radio Towers (DART) is a Non-Profit effort based in New York to defend the rights of tower owners in a precedent-setting circumstance in Dix Hills. Inquiries may be addressed to DART, P.O.B. 2851, Huntington Station, NY 11746.

• On the mend after bypass surgery, WØPN (triple) and LU1AHC (quadruple). Both Ron and Art are up and about. Art recently was sufficiently spirited to visit New York City on business! Ron extends thanks for greetings extended to him from as far as Europe and New Zealand.

• The North American Teleconference Net airs next on 2 Dec. with pioneer packeteers Lyle Johnson, WA7GXD, and Harold Price, NK6K, on tap. With the burgeoning interest in packet evident worldwide, this TRN event is a 'must.' have your repeater council contact the Midway Radio Club, Kearney, Nebraska for information on linking up with the net.

• Another ham has appeared in the ranks of U.S. Astronauts. As it turns out he was there all the time! Just hadn't emerged into public view until recently. The new find is John-David Bartoe, N4NYZ. He is a Payload Specialist and will fly along with Dr. Tony England, WØORE when the latter flies next spring. According to Roy Neal, K6DUE, the proposal to take SSTV along on the mission is doing very well through the review cycle. There are now 5 hams among the astronauts; four are Americans and there is one Dutchman.

• Word from UA3CR via G3IOR is that RS-6 expired at 0430 UTC, 19 Sep. after having completed 19,778 hours of operation and 12,175 orbits. *Do svidaniya*!

• Leading the Member Recruitment Drive and primed to claim the Grand Prize Yaesu FT-726R is Andy Deskur, KA1M. Still time to catch him though, or to claim one of the other terrific prizes. Join up a few members today!

• University of Surrey now has two (count 'em) telephone lines for satellite information. Info on UO-9 is available at 483-61707. UO-11 info is available on 483-61202.

• AO-10 completed its 1000th orbit on 14 Oct. Nice milestone to recall!

• SU1AS has been heard on AO-10. G3IOR now estimates 103 countries have been active on AO-10.

• A beginners' net is hosted each Wednesday evening at 9:00 EST on 3855 kHz by KA9LCF. Questions you need answers for? Stop by any Wednesday.

• Questions abound as to why the MARCE package on Shuttle mission STS 41G was unheard on the ground. According to lead experimenter Ed Stluka, W4QAU, everything seemed in order when the GAS can was opened at the Kennedy Space Center. An investigation is being conducted by the Goddard Space Flight Center.

• The W3IWI Packet Radio Bulletin Board System (PRBBS) is running on AO-10 in conjunction with an FCC STA issued 18 Oct. 84. Participating in early tests with Tom were VE1PAC/VE6, K7PYK, W4DAQ and N5AHD. Tom's PRBBS on SSC H1 runs a Xerox 820, WØRLI software and a TAPR TNC to a 202-type modem using 1 kHz FSK.

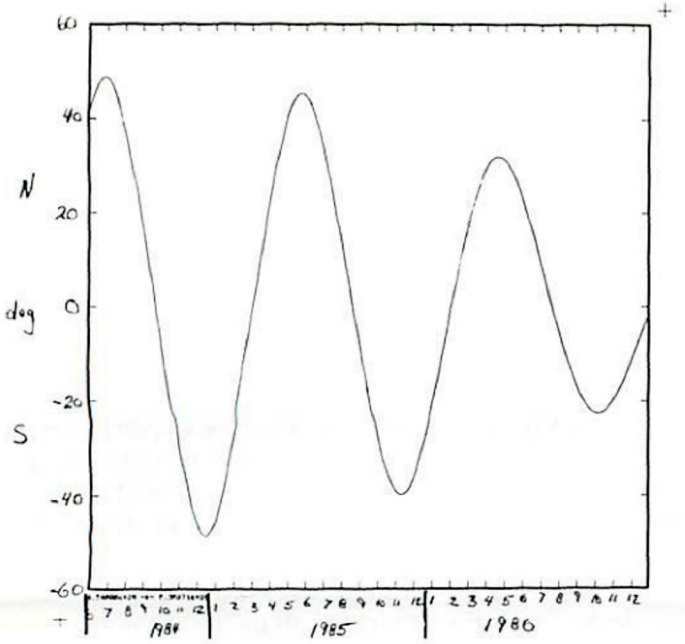
New AO-10 Sked Anticipated To Relieve Battery Load

Increased battery load resulting from increasing Mode B transponder usage, especially on weekends, has led satellite controllers and engineers to recommend a modest rollback in operating time. According to VE1SAT/VE6, who is in charge of AO-10 for this period, discussions with DJ4ZC suggest an adjustment may be in order to avoid approaching automatic cutoff regimes. Presently AO-10's transponders are on for all but about 45 minutes per orbit. With the heavy weekend usage now evident, this 'nap time' recharge period must be increased to provide a net positive energy equation for each orbit. The recommendations to AMSAT Management were to increase the 'Off' time slightly and, since Mode L is a very light user of power, to implement Mode L on Sundays in the same period as it appears throughout the week, i.e., MA 100 thru 117. Sunday is a very heavy usage day.

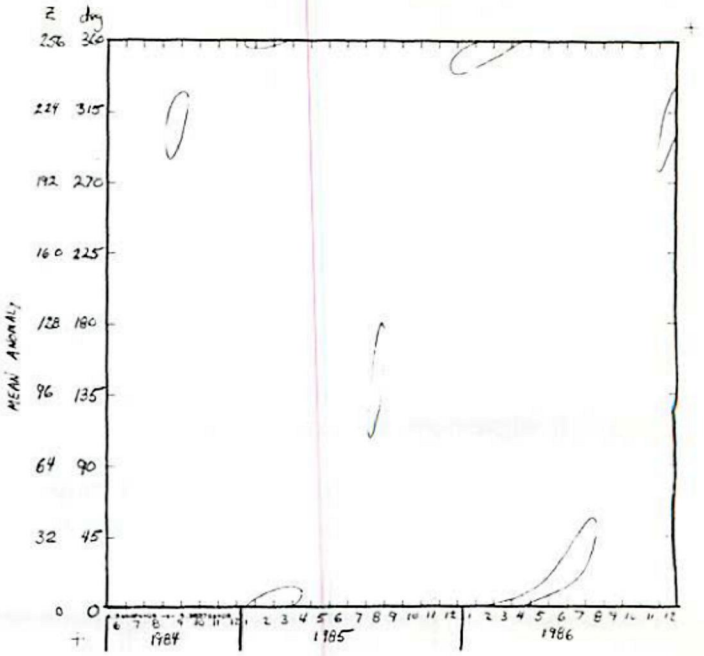
The changes in the transponder schedule are anticipated on or about 1 Dec. 84. Users should watch the AO-10 beacon bulletins (145.810 and 435.040) for news of imminent change. Keeping well-tuned to your AMSAT Nets will help as well.

Further refinements in the schedule are anticipated early next year when a minor series of eclipses will occur. (See accompanying graph and *ASR* 83).

AO-10 Sun Latitude in Orbital Plane Coordinates



AO-10 Eclipses Vs. Mean Anomaly and Date



Another Mystery Satellite

Signals from an interloper in the Amateur bands have excited UHF experts and EMEers worldwide. What has them aghast is the 2304 MHz signal originating from (apparently) a Russian early warning satellite. According to WB5LUA and KA1GT, the signals are strong enough to be heard using only a coffee can feed waved around in the general direction of the Russky bird!

Detailed reports sent to *ASR* from W4HHK and others document a powerful satellite signal in what appears to be a near-polar, Molniya-type orbit. As reported in these pages two years ago (*ASR* 26 and 28), such signals were at that time attributed to Cosmos 1217, a Russian early warning satellite. KA1GT mentioned the sighting in his *QST* (Apr. 82) 'New Frontier' column. Identification of the source as Cosmos 1217 was made by an anonymous official source.

It is quite clear now, however, that the source(s) being observed now is (are) not Cosmos 1217. At least it is not 1217 alone. A check with Dick Flagg of the famous Kettering Group of satellite sleuths confirmed the observations reported do not correlate with the position of 1217 as computed from the NASA 2-liners for 1217. According to Flagg, Cosmos 1217, object 12032, has orbital elements as follows:

Ref Epoch: 84 295.576043
Drag: 1.1E-5
Incl: 66.82
RAAN: 330.87
Ecc: 0.6822
Arg Per: 302.2
MA: 9.344
MM: 2.009
Rev: 2926

The signal is strong enough (50 to 52 dB above cold sky at OE7PHJ!) to provide a serious impediment to EME work when it's in view. Nevertheless, according to ITU allocations, the 2304 band is for radiolocation (primary) and amateur (secondary). If, as suggested previously in *ASR*, this really is an early warning satellite creating all the racket, there may be very little that can be done. Certainly, it would seem, the bird is squawking on a frequency allocated to it by the ITU however onerous its screech may be to the Amateur Radio Community.

Early warning satellites of the type thought to comprise Cosmos 1217 and similar birds of the feather detect ballistic missles in the boost phase by detecting the infrared signature of the exhaust plume. Whether this function is within the definition of 'radiolocation' is arguable. Semantics notwithstanding, it's probably been with us for some time as K2UYH's 432 and Above EME News reported similar signals as early as December 81.

AO-10 Current Transponder Operating Schedule

Pursuant to the schedule effective 16 Oct. 84, the following is the transponder operating schedule:

Mean Anomaly	Mode
235-099	B
100-117	L (Except Sunday; B)
118-218	B
219-234	Off

As noted elsewhere herein, watch for future changes on/about 1 Dec 84. Watch the beacon on AO-10 for announcements and details.

Ohio AMSAT Management Team To Meet

AMSAT Area Coordinators and staff from around Ohio will hold a management conference on 1 Dec. 84 in Chillicothe, OH, according to Ohio Area Coordinator and meeting organizer Dick Burggraf, W8PGP.

The conference will be hosted by the AMSAT Southern area and is open to all visitors and interested parties. Specific topics to be covered include how the volunteer program operates, member recruiting techniques, effective AMSAT presentations, organizing and staffing an AMSAT booth at a convention or hamfest, starting and operating an AMSAT net on your local repeater, where and how to obtain answers to your questions, how to be a good satellite Elmer and practical suggestions on getting started in OSCAR satellites.

Special Guest luncheon speaker will be John Champa, K8OCL, AMSAT Senior Vice President. John will speak on 'AMSAT Field Organization: The Critical Role of the Area Coordinator'. The meeting will be held at the L-K Restaurant, 1135 E. Main St. in Chillicothe. It is just off state route 23 and 35 at the East Main Street exit. Talk-in will be on 146.25-85.

Further information may be obtained from W8PGP at 988 Prosperity Road, Waverly, OH 45690. You may call Dick at 614-947-5483. Remember...all are welcome. AMSAT congratulates the initiative of the stalwart Ohio team for leading the way towards a rejuvenated Area Coordinator Team. Well done, chaps! (A $10 donation will cover lunch and hand-out materials).

1984 SET Yields Satellite First

The 1984 Simulated Emergency Test was highlighted by the first SET formal messages being sent to ARRL Hq. via satellite. K8OCL in Dearborn, Michigan and N4AZI in Baton Rouge, Louisiana orginated the messages and transmitted them through OSCAR 10 to W1NU in Connecticut. W1NU then called ARRL Hq by landline.

The text of these historic messages was: 'AMSAT Satellite Emergency Communications System activated for 1984 SET on Oscar 10 SSC H1 X ASECS will be available for all future drills and emergency situations.'

A new era in emergency communications has begun with the 1984 SET. ASECS is the AMSAT Satellite Emergency Communication System. Dave Eanes, N4AZI is AMSAT Emergency Communications Manager while K8OCL is Acting Vice President for Operations. (Tks *ARRL letter*).

Space News On Computer

Space News, a bi-weekly newsletter, has now begun operating a computer information service to disseminate news of discoveries and developments as rapidly as possible. The constantly updated computer files are part of the CompuServe Information Service. While there is no charge specifically to access the *Space News* files, you must be a subscriber to CompuServe in order to use the system, and normal time charges will apply. Information on CompuServe is available from 5000 Arlington Center Blvd, Columbus, OH 43220 or call 1-800-848-8990 (not a computer line).

Once you have accessed CompuServe, at the first '!' prompt, type 'PRO'; this will take you to the programming area and 'OK' will appear when the transfer is complete. Then, type in 'R ACCESS' to get to the public access files. To access *Space News* service, input 'R SPACENWS.TXT [70376,534].

The screen, at this point, will appear like this: !PRO OK R ACCESS PUBLIC FILE ACCESS SYSTEM USE ? FOR HELP ACCESS: R SPACENWS.TXT [70376,534] and the information files will then follow, with the latest news always appearing first. To stop the output, enter 'CONTROL-C'. To re-enter the normal CompuServe area, or at the end of the file, enter 'EXIT', then 'R DISPLA'. Feel free to correspond with *SPACE News* using the above Personal Identification Number and CompuServe electronic mail (EMAIL).

In March 1985, *SPACE News* will devote a special expanded issue to computers and their uses in astronomy and space science, featuring both software and hardware applications. Any ideas, comments, or suggestions on this are welcome. (Tks *SPACE News*)

Metroplex To Buy Satellite Air Time For News Relay

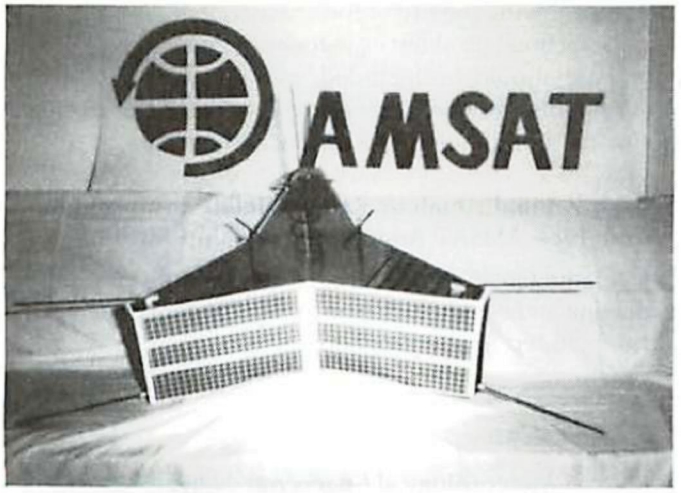
According to *Westlink's* Bill Pasternak, WA6ITF, New Jersey's Metroplex repeater organization will be purchasing the use of a voice channel on a geosynchronous satellite such as Telstar 301 or Satcom 4 to provide national distribution of the *Metroplex News*, *Westlink News* and the quarterly Teleconference Radio Nets. The time is being purchased as 52 half hour blocks (1 per week) and four 2 hour blocks for the TRNs. Downlinking will be to hams with TVRO equipment who will patch the audio channel into the local repeater for the ham community served. The FCC has informally given the green light to the scheme inasmuch as both the source and the audience of the program material is amateur radio. In this account it differs negligibly from amateur radio use of autopatch facilities. Both use common carrier channels for the transmission of explicitly Amateur Radio materials.

In a paper to be read to the AMSAT Second Annual Space Symposium on 10 November, Dr. Al Dayton, KA4JFO, discusses 'Advanced Gateway Concepts' in which he proposes to link up hundreds or thousands of repeaters nationwide using a hams-only C-Band geosynchronous satellite with as many as 24 transponders aboard.

Weekend Net Squeeze

The AMSAT 15 meter and 20 meter International Nets have been a mainstay of the organization for years. Now, however, several factors are coming into play which may affect the future of these weekend fixtures.

Propagation is declining rapidly. Consequently the served areas are not consistently reached. Second, traffic levels, especially contest activity on 20 and 15, seem to be increasing. Contests diminish the effectiveness of the nets at best.



Dave Kifer, N8ETY, recently constructed this handsome model of AO-10 from prints originated by AMSAT DL. The model is about 77 cm (2.5 feet) across and made its first public appearance at the Cleveland Hamfest recently.

At times they totally destroy the nets. Third, the staff of Net Control Stations has declined through attrition without replenishment. Although replacements have been earnestly sought for nearly a year, only W7FF has come forward. He has replaced W6CG on the SW Pacific Net. NCS remaining for the 20 and 15 meter nets are N4HY and W8GQW. With W8GQW about to embark on his winter sabbatical to Arizona, N4HY is faced with the prospect of handling the nets alone. With his travel/business schedule uncertain, the 20/15 nets are in, to be kind, critically understaffed condition.

Consequently, Net Manager W8GWQ has recommended to AMSAT Management that a series of service modifications be adopted that more realistically reflect communication needs and organizational capabilities. Wray suggests that the 20/15 meter nets be reduced in frequency to once or twice per month and that concurrent with that, a regular bulletin service from AMSAT be offerred on AO-10. AMSAT UK now provides a service of this kind. (See *ASR* 84).

Moreover, Wray points out, the requirements for 20 and 15 meter coverage have changed dramatically since the service was initiated. AMSAT now has extensive news dissemination capabilities through *ASR*, *OSCAR NEWS* (AMSAT UK), *AMSAT JOURNAL* (AMSAT DL) and others. There are numerous national and regional nets active (e.g UK nets, Argentina, Australia, etc.). Moreover, with the addition of intercontinental electronic mail, there may be, says W8GQW, less need for the 20/15 meter nets than previously.

Net Manager W8GQW invites comments on his thoughts in this regard to his home at 1617 West McKaig, Troy, OH 45373.

Hamtronics Readies New Wish List

Included among the offerings in the new 1985 Hamtronics catalog are several items of interest to the satellite enthusiast. In addition to transmitting and receiving converters for the 145- and 435-MHz bands, the catalog describes a line of GaAs FET receiver preamplifiers for improving Mode B reception. Especially of interest to those following the U.S. manned spacecraft program are a series of receivers designed for reception of Space Shuttle communications. The 1985 Hamtronics catalog is available free and can be obtained by calling (716) 392-9430 or writing to Hamtronics, Inc., 65-F Moul Rd., Hilton, NY 14468-9535. For overseas delivery, include $2 or four International Reply Coupons (IRCs). Please tell them you saw it in *ASR*.

Moscow on the Hudson: New York City Earth Station snares Soviet TV

Sovietologists and others at Columbia University have a unique research tool thanks to satellite technology. Under the direction of the W. Averell Harriman Institute for Advanced Study of the Soviet Union, the first commercial earth station for Russian Molniya television satellites has been installed atop the school's 15-story International Affairs - Building. Columbia is now the first major university in the Western hemisphere to have access to the same television shows that millions of Russians watch every day.

Earlier engineering surveys of the site at 118th Street in Manhattan had ruled out the installation due to interference from nearby telephone-company transmitters and other noise sources. The company Orbita Systems, however, was successful in setting up the station in time for its inauguration on October 4th.

The installation includes a 3.6-m parabolic dish antenna, a modified commercial microwave receiver, a SECAM color monitor, and a special receiver to demodulate the Russian satellites' unique digital audio transmissions. The antenna is controlled by an Apple IIe computer, which was programmed to automatically track the Russian satellites as they appear over the northern horizon.

The Soviet Molniya satellites use a so-called 'sound-in-syncs' digital pulse code to carry the audio during the picture's horizontal blanking interval. That is very much different from the conventional FM subcarrier used by most Western television satellites. Also different is the picture transmission, which is a modified version of the French 625-line SECAM color standard. The downlink from the Molniya birds requires a circularly polarized antenna.

Sneak a Peak at Russian TV

Tired of the ordinary fare on American television? Want to see for yourself what the Soviet government is showing its citizens during prime time? If you own a backyard earth station (and many hams do) you may be able to get a glimpse of Russian television without any added expense. Here's how:

The easiest way to find a Molniya bird is to monitor between 4 PM and 7:15 AM EST. Tune your receiver to 3.875 GHz, just above U.S. transponder 9, and aim your antenna north, in the direction of Mansel Island, Hudson's Bay, Ontario, Canada. Molniya's apogee is about 40,000 km above Mansel and the satellite will appear to hang almost stationary for about one hour at that location.

If you have an azimuth-elevation mount, try swinging the antenna a few degrees around until you find the satellite's

downlink. Once you find the satellite, you will be able to track Molniya through most of its 6-hour loop until it is turned off at the U.S.-Canadian border.

Since it is transmitted at 25 rather than 30 frames/s, as in the U.S., the picture from Molniya will roll vertically. Simply adjust the television set's vertical hold to stabilize the picture. The set's vertical linearity might also have to be adjusted since the picture's 625-line scan might make the Russians appear tall and skinny. There may also be some jitter and tearing of the picture but it should be watchable.

Home viewers were previously able to pick up another Russian satellite--Ghorizont--but that geosynchronous satellite no longer transmits a strong signal towards the U.S. The satellite's mission was redefined in mid-September and the powerful transponders are now assigned to digital services.

The four Molniya satellites travel in an eccentric polar orbit. Every six hours, one of the satellites skims through the Southern hemisphere and rises in the sky as it travels over the U.S. up the Mississippi River. Television relay to the Soviet Union begins as the bird reaches mid-Ontario. During its transmission, the satellite continues to soar higher, reaching its 40,000 km apogee some two hours after transmission began.

At the end of its six-hour stint, as the satellite reaches its turn-off point just north of the Great Lakes, transmission is handed over to the next satellite, which is beginning its loop north of Duluth, Minnesota. Because of its polar orbit, the Molniya satellite can provide one-hop distribution to almost anywhere in the densely-populated Northern hemisphere. By comparison, a geosynchronous system requires three satellites.

UoSAT Spacecraft Control Centre
University of Surrey

General News

UoSAT-OSCAR-11 QSL

The first printing of these QSL cards was rejected but relacements are promised for next week! Patience will be rewarded!

UoSAT-OSCAR-9 Competition

We should like to remind schools etc. that the Department of Electronic Engineering of the University of Surrey has offered a prize of 100 pounds, or equivalent, to the student group it considers to have been the most successfully active utilising the telemetry and experiments from the UO-9 spacecraft. The competition was announced in the UoSAT School's Booklet, 'UoSAT - A Guide to its Capabilities, Operation & Usage', published by UoS in 1982 and is open to all student groups from educational establishments worldwide. Submissions for the competition, which is intended to encourage the educational usage of the spacecraft, should be in the form of a detailed report showing clearly the experimental programme development, receiving & display equipment, computer software and the results of the experiments carried out. Particular notice will be taken of examples showing the use of the spacecraft in demonstrating space technology in the class-room. Photographs, where appropriate should be included, as well as examples of graphical plots and computer displays of data. The closing date for the competition is 31st December 1984.

Second Annual Amateur Radio Satellite Symposium And 1984 AMSAT Annual Membership Meeting

G3YJO and G8NOB (Martin & Neville) will be attending the Meeting and it is likely that an additional item on UoSAT will be included in the Programme.

Meteorological Spacecraft News

NOAA-9

The launch of NOAA-F (9) is now set for the 8th of November.

UoSAT-OSCAR-9 Schedule

This weeks schedule is as follows:

Friday — load Bulletin
Saturday — Bulletin/DIGITALKER/1200 bps telemetry
Sunday — Bulletin/DIGITALKER/1200 bps telemetry
Monday — Bulletin/DIGITALKER/1200 bps telemetry
Tuesday — CCD Camera - next week Radiation data
Wednesday — Whole orbit telemetry survey
Thursday — Computer check-summed telemetry

The 21 MHz Beacon will be in use this week.

UoSAT-OSCAR-11 Operations

Digital Communications Experiment

NK6K and LSK have spent much time this week preparing for activation of the DCE by carrying out digital communication calibration tests using the 435 MHz beacon in

Gaithersburg (MD) Hamfest brought out the AMSAT HQ crew. (l-r) N2CF, N3CEG, W3IWI, W4PUJ, Martha.

1200 bps afsk. The UO-11 DCE will be a major topic of discussion (2days!) following the AMSAT Meeting in LA next week with G3YJO & G8NOB.

The 435 MHz downlink is functioning well with an output rf power of 750mW to 1 watt, consuming around 225 mA from the + 14v unregulated bus. Very strong signals are received from this beacon, 1200 bps afsk telemetry has been copied at UoS without difficulty using an IC471, no preamp and a linear polarised yagi.

Experiments continue with the 9600 bps nrzi psk data on the 435 MHz downlink in preparation for DCE, CCD & Particle/Wave Experiments.

Particle/Wave Experiments — UO-11 and the AMPTE spacecraft are in conjunction for two weeks allowing the simultaneous measurement of P/W interactions with UO-11 and UKS. A number of regular P/wave surveys over the North polar regions have been carried out using the OBC and the DSR this week. Most of the data was dumped using the 145 MHz downlink whilst work continues on the 435 MHz psk downlink system. These conjunctions occur only once every six months so we must make the most of it!

A daily account of UO-11 operations follows:

DAY	ORBIT	CHANNELS	RESET TIME
Friday	3488	1,2,3,52	13:17:25
	3491	435 MHz DCE 1200 bps afsk test	
	3492	435 MHz DCE 1200 bps asfk test OBC switched back to 145 MHz after 1hr25m	
Saturday	3502	45,52	12:15:50
		435 MHz DCE 1200 bps afsk test OBC switched back to 145 MHz after 6hrs	
Sunday	3516	P/wave survey	11:18:45
	3517	DSR P/wave dump OBC switched back to Tlm after 9hrs	
Monday	3530	Spacecraft despin to 3m50s	
	3531	Spacecraft despin to 5m	
		P/wave survey	11:56:40
		435 MHz DCE 1200 bps afsk test OBC switched back to Tlm after 9hrs	
	3538	45,52	23:04:45
		435 MHz DCE 1200 bps afsk test OBC switched back to 145 MHz after 7hrs	
Tuesday	3544	P/wave survey	09:23:15
	3545	1,2,3,52	10:51:02
		DSR P/wave dump	
	3551	Tlm 435 MHz DCE 1200 bps afsk test OBC switched back to 145 MHz after 11hrs	
Wednesday	3558	ODATA dump	
	3559	435 MHz 9600 bps psk tests	
	3560	ODATA dump	
	3561	435 MHz 9600 bps psk tests	
		1,2,3,52	13:11:00
	3565	45,52	19:26:40
		435 MHz DCE 1200 bps afsk test OBC switched back to 145 MHz after 12hrs	
Thursday	3573	P/wave survey	08:56:35 up
		ODATA dump	
	3574	P/wave data dump on 435 MHz at 9600 bps	
	3575	same as 3574 145 MHz Tlm	
	3579	45,52	18:34:20
		435 MHz DCE 1200 bps afsk test OBC switched back to 145 MHz after 12hrs	
Friday	3487	DSR 9600 bps nrzi psk tests	

Thanks for Reports & Questionnaire Returns

W7AVE, V3CE, HB9RKR, ZS1BI, DL7OU, H.J.Meerza, G4BBH, JA2WO, HB9RJV, VK2AVH, HB9RKR.
This week: ZL2AHK, VE3CIE.

Packet Bulletin Board Tests On AO-10

On October 18th, the Federal Communications Commission granted a Special Temporary Authorization (STA) permitting 21 amateurs to operate TelePorts capable of automatically relaying digital (packet radio) communications between terrestrial packet radio networks using amateur satellites.

As a first phase of the new AMSAT/ARRL TelePort STA, a unique packet radio test was carried out on Sunday, October 28. An automatic packet radio bulletin board system (PRBBS) operated by Tom Clark (W3IWI) was placed in experimental operation on the AMSAT-OSCAR-10 satellite. The W3IWI PRBBS was sucessfully used by several amateurs across the U.S. and in Canada. Earlier this year, successful PRBBS tests thru the same satellite had involved 'gateway' links to existing terrestrial PRBBS systems in California.

The following stations participated in this test and successfully logged onto the W3IWI PRBBS: Randy Smith (VE1PAC/VE6), Medley, Alberta; Wes Morris (K7PYK),

Scottsdale, Arizona; 'Mac' Jordan (W4DAQ), Demopolis, Alabama; Bob Diersing (N5AHD), Corpus Christi, Texas. A number of other stations were also monitoring and reported good copy.

Both VE1PAC and K7PYK sent and received several messages and files during their connections with the PRBBS. K7PYK maintained contact for about an hour and managed to acquire about 50 kilobytes of documentation from W3IWI. W3IWI and VE1PAC tested full-duplex PRBBS operation thru the AMSAT-OSCAR-10 satellite and achieved sustained data thruput of about one kilobaud despite the 0.25 second round-trip propagation time to the satellite.

The packet radio hardware used at W3IWI is normally used as a local area PRBBS serving Baltimore-Washington. It consists of a Xerox 820 computer running WØRLI software and a TAPR BETA TNC. The packet radio links were running at 1200 baud data speeds and used 1000 Hz shift FSK modulation generated by '202A' style modems.

Both W3IWI and N5AHD are among the 21 amateurs approved for the TelePort STA.

Orbit Predictions

By KA9Q

Satellite:	*OSCAR-10*
Catalog number:	14129
Epoch time:	84302.80544058
Sun Oct 28 19:19:50.66 1984 UTC	
Element set:	139
Inclination:	25.8950 deg
RA of node:	170.9852 deg
Eccentricity:	0.6043569
Arg of perigee:	318.3303 deg
Mean anomaly:	8.8986 deg
Mean motion:	2.05849013 rev/day
Decay rate:	-9.3e-07 rev/day± 2
Epoch rev:	1036
Semi major axis:	26106.133 km
Anom period:	699.541853 min
Apogee:	35507.212 km
Perigee:	3952.369 km
Ref perigee:	2492.79343259
Sun Oct 28 19:02:32.575 1984 UTC	
Beacon:	145.8100 MHz

Satellite:	*OSCAR-11*
Catalog number:	14781
Epoch time:	84294.64465474
Sat Oct 20 15:28:18.169 1984 UTC	
Element set:	45
Inclination:	98.2291 deg
RA of node:	356.3783 deg
Eccentricity:	0.0012301
Arg of perigee:	256.2334 deg
Mean anomaly:	103.7499 deg
Mean motion:	14.61913264 rev/day
Decay rate:	1.28e-06 rev/day± 2
Epoch rev:	3403
Semi major axis:	7062.219 km
Anom period:	98.501056 min
Apogee:	712.522 km
Perigee:	695.148 km
Ref perigee:	2484.62494125
Sat Oct 20 14:59:54.923 1984 UTC	
Beacon:	145.8260 MHz

Satellite:	*RS-3*
Catalog number:	12997
Epoch time:	84291.01063423
Wed Oct 17 00:15:18.797 1984 UTC	
Element set:	105
Inclination:	82.9576 deg
RA of node:	65.5152 deg
Eccentricity:	0.0059450
Arg of perigee:	92.8891 deg
Mean anomaly:	267.8951 deg
Mean motion:	12.15588892 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12573
Semi major axis:	7987.323 km
Anom period:	118.461102 min
Apogee:	1677.673 km
Perigee:	1582.704 km
Ref perigee:	2481.03168139
Wed Oct 17 00:45:37.272 1984 UTC	

Satellite:	*RS-4*
Catalog number:	13000
Epoch time:	84303.37803156
Mon Oct 29 09:04:21.926 1984 UTC	
Element set:	230
Inclination:	82.9612 deg
RA of node:	68.7066 deg
Eccentricity:	0.0018422
Arg of perigee:	154.8385 deg
Mean anomaly:	205.3581 deg
Mean motion:	12.06671512 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12627
Semi major axis:	8026.651 km
Anom period:	119.336537 min
Apogee:	1667.100 km
Perigee:	1637.527 km
Ref perigee:	2493.41363038
Mon Oct 29 09:55:37.664 1984 UTC	

Satellite:	*RS-5*
Catalog number:	12999
Epoch time:	84299.38650714
Thu Oct 25 09:16:34.216 1984 UTC	
Element set:	198
Inclination:	82.9551 deg
RA of node:	72.5190 deg
Eccentricity:	0.0010157
Arg of perigee:	189.2433 deg
Mean anomaly:	170.8426 deg
Mean motion:	12.05048895 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12562
Semi major axis:	8033.860 km
Anom period:	119.497226 min
Apogee:	1664.418 km
Perigee:	1648.098 km
Ref perigee:	2489.34712593
Thu Oct 25 08:19:51.680 1984 UTC	

Satellite:	*RS-6*
Catalog number:	13002
Epoch time:	84291.00522427
Wed Oct 17 00:07:31.376 1984 UTC	
Element set:	91
Inclination:	82.9561 deg
RA of node:	67.7672 deg
Eccentricity:	0.0050792
Arg of perigee:	112.2176 deg
Mean anomaly:	248.4234 deg
Mean motion:	12.13563502 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12549
Semi major axis:	7996.213 km
Anom period:	118.658809 min
Apogee:	1676.734 km
Perigee:	1595.506 km
Ref perigee:	2481.03076352
Wed Oct 17 00:44:17.968 1984 UTC	

Satellite:	*RS-7*
Catalog number:	13001
Epoch time:	84290.37879109
Tue Oct 16 09:05:27.550 1984 UTC	
Element set:	177
Inclination:	82.9551 deg
RA of node:	73.3917 deg
Eccentricity:	0.0022547
Arg of perigee:	138.7338 deg
Mean anomaly:	221.5393 deg
Mean motion:	12.08686113 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12491
Semi major axis:	8017.724 km
Anom period:	119.137631 min
Apogee:	1666.820 km
Perigee:	1630.664 km
Ref perigee:	2480.41061185
Tue Oct 16 09:51:16.863 1984 UTC	

Satellite:	*RS-8*
Catalog number:	12998
Epoch time:	84294.06109772
Sat Oct 20 01:27:58.843 1984 UTC	
Element set:	297
Inclination:	82.9555 deg
RA of node:	77.6208 deg
Eccentricity:	0.0018504
Arg of perigee:	255.2468 deg
Mean anomaly:	104.6575 deg
Mean motion:	12.02950215 rev/day
Decay rate:	4e-08 rev/day± 2
Epoch rev:	12476
Semi major axis:	8043.207 km
Anom period:	119.705702 min
Apogee:	1699.643 km
Perigee:	1669.876 km
Ref perigee:	2484.03693086
Sat Oct 20 00:53:10.826 1984 UTC	

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